

**Report on May 2002 collection of *Lampsilis higginsi* from the St.  
Croix R., Minnesota for use as brood stock for mussel propagation  
at the Genoa National Fish Hatchery.**

Wisconsin Department of Natural Resources, Minnesota Department of Natural Resources and  
the U. S. Fish and Wildlife Service.

8 August 2003.

This is a report on the 2002 collection of female *Lampsilis higginsii* from the St. Croix River, Minnesota, adjacent to Hudson, Wisconsin for use as brood stock for mussel propagation at the Genoa National Fish Hatchery. This mussel propagation is related to the reauthorization of the Mississippi River System Navigation project by the U. S. Army Corps of Engineers in cooperation with an associated team known as the Mussel Coordination Team.

Persons involved in the 1 May 2002 collection were staff from the Wisconsin Department of Natural Resources (Ronald Benjamin, David Heath), Minnesota Department of Natural Resources (Mike Davis, Dan Kelner), U. S. Fish and Wildlife Service (Nick Rowse) and the University of Minnesota (Mark Hove).

A description of the collection location is as follows: 44° 58' 04.5"N, 92° 46' 05.5"W, Twp. 29N, Rng 20W, Sec 26, SW of NW of SE, Washington County, Minnesota, St. Croix rivermile 17.28 (see Figure 1). Water temperature was 9.0°C (48.2°F) and air temperature was 17°C at noon (63°F). The sky was mostly sunny.

**Figure 1. Location where *L. higginsii* were collected and relocated to near Hudson, Wisconsin on 1 May 2002.**



A total of 59 living *L. higginsii* were collected and 1 *L. siliquioidea* putatively identified as the subspecies "*pepinensis*". Of the living *L. higginsii*, there were 43 females, 15 males and one of unknown sex. The single "*pepinensis*" had female conchology but male or sterile demibranchs. Data for all specimens collected is given in Table 1.

Of the 43 females, 40 were gravid (93%), 2 were not and 1 small individual was not examined. Of these 40 gravid, 32 had demibranchs fully inflated (80%). In general, gravid females may have been at their

optimal brooding condition – although 9 had partially charged demibranchs (=23%) and 15 were actively aborting (=38%). In most cases, these aborting females had a small 2-4mm diameter mound of glochidia covering 1 to 8 ostia. A year earlier, during 2001, collections made at the same location, 14 of the 23 gravid females (=61%) were found aborting and 16 of the 23 were found with partially charged demibranchs (=70%). This 23 point decrease in active abortion and 47 point decrease in partial marsupial charging from 2001 to 2002 may be due to earlier collection and colder water temperature in 2002. During 2002, we collected 16 days earlier when the water temperature was 10°C colder.

In 2002, a total of 21 gravid female *L. higginsii* and the single *L. siliquioidea* were transported, in coolers with aerated river water, to the Genoa National Fish Hatchery for use in artificial propagation, or in the case of the *L. siliquioidea*, for tissue sampling. These 22 mussels had never been used previously in artificial propagation. The US Army Corps of Engineers took tissue samples from all 22 transported specimens for future genetic analysis.

A total of 19 mussels were used for propagation at the Genoa National Fish Hatchery. Two *L. higginsii* (# 791 and # 770) and one *L. siliquioidea* (# 790) were not used for propagation. On May 9, 2002, after use in the hatchery, WDNR staff returned all 22 mussels to the St. Croix R. immediately upstream of the collection location (see Figure 1, 44° 58' 04.6"N, 9°2 46' 06.8"W).

Attached are photographs of the 21 *L. higginsii* and 1 *L. siliquioidea* sent to the Genoa National Fish Hatchery (Figures 2-23) as well as copies of the field data sheets (Figures 24-26).

**TABLE 1. List of mussels with tag numbers (Tagn), length & height (mm), age (years), sex (F=female, M=male) and gravidity status (Y=Yes, N=No) collected in the St. Croix River near Hudson, Wisconsin on 1 May 2002. A total of 21 *L. higginsii* and 1 *L. siliquioidea* "*pepinensis*" sent to the Genoa National Fish Hatchery.**

TAGN	LENGTH	HEIGHT	AGE	SEX	GRAVID	COMENT2
<i>L. higginsii</i>						
725	78	65	20	F	Y	HALF CHARGED.
726	74	61	15	F	Y	HALF CHARGED.
732	82	64	18	F	Y	FULLY CHARGED. RELEASING THRO OSTIA.
733	72	59	11	F	Y	FULLY CHARGED.
734	76	62	15	F	Y	FULLY CHARGED. RELEASING THRO 8 OSTIA.
735	64	54	9	F	Y	FULLY CHARGED.
738	73	58	8	F	Y	FULLY CHARGED. RELEASING THRO 1 OSTIA.
741	75	60	17	F	Y	FULLY CHARGED.
742	73	60	13	F	Y	HALF CHARGED. RELEASING THRO 6 OSTIA.
743	92	73	15	F	N	
749	72	58	22	F	Y	FULLY CHARGED.
753	78	62	16	F	Y	HALF CHARGED. RELEASING THRO OSTIA.
757	82	66	23	F	Y	HALF CHARGED.
758	79	71	17	F	Y	DISPLAYING. FULLY CHARGED. RELEASING THRO OSTIA. TO GENOA.
759	81	58	19	M		
760	84	61	19	M		
761	100	74	28	M		
762	67	55	8	F	Y	FULLY CHARGED. TO GENOA.
763	79	67	10	F	Y	FULLY CHARGED. TO GENOA.
764	75	63	14	F	Y	FULLY CHARGED. TO GENOA.
765	59	50	7	F	Y	SLIGHTLY CHARGED.
766	77	68	13	F	Y	FULLY CHARGED. TO GENOA.
767	83	66	17	F	Y	FULLY CHARGED. RELEASING THRO OSTIA. TO GENOA.
768	60	53	7	F	Y	FULLY CHARGED. TO GENOA.
769	62	52	5	F	Y	FULLY CHARGED. TO GENOA.
770	64	57	9	F	Y	FULLY CHARGED. RELEASING THRO MANY OSTIA. TO GENOA.
771	91	69	20	M		
772	98	68	17	M		
773	85	68	21	M		
774	49	35	5			
775	60	48	6	M		
776	85	66	17	F	Y	FULLY CHARGED.
777	64	54	8	F	Y	ONE-QUARTER CHARGED.
778	69	59	9	F	N	
779	72	56	7	F	Y	HALF CHARGED.
780	77	62	11	F	Y	FULLY CHARGED. TO GENOA.
781	72	60	9	F	Y	FULLY CHARGED. TO GENOA.
782	72	60	9	F	Y	FULLY CHARGED. TO GENOA.
783	50	42	6	F	Y	FULLY CHARGED.
784	75	65	11	F	Y	FULLY CHARGED. TO GENOA.
785	94	77	22	F	Y	FULLY CHARGED. TO GENOA.
786	85	65	23	F	Y	FULLY CHARGED. RELEASING THRO MANY OSTIA. MARSUPIA OUTSIDE OF SHELL. TO GENOA.
787	76	62	14	F	Y	FULLY CHARGED. TO GENOA.
788	81	69	16	F	Y	FULLY CHARGED. RELEASING THRO 2 OSTIA. TO GENOA.
789	87	69	23	M		
791	81	63	19	F	Y	FULLY CHARGED. RELEASING THRO 5 OSTIA. TO GENOA.
792	.	.	.	F	Y	HALF CHARGED. RELEASING THRO 2 OSTIA.
793	72	61	18	F	Y	FULLY CHARGED. RELEASING THRO 3 OSTIA. TO GENOA.
794	92	70	19	F	Y	FULLY CHARGED. TO GENOA.
795	84	69	23	F	Y	FULLY CHARGED. RELEASING THRO 5 OSTIA. TO GENOA.
1000	76	57	15	M		
1313	81	63	11	M		
1371	86	63	22	M		
1383	87	64	17	M		
1476	85	63	13	F	Y	FULLY CHARGED. RELEASING THRO 2 OSTIA.
1481	84	69	23	M		
1516	78	62	23	F	Y	FULLY CHARGED.
1519	78	60	9	M		
1533	91	62	13	M		
<i>L. siliquioidea</i>						
790	93	61	14	F	N	PEPINENSIS FEMALE CONCHOLOGY, MALE GILLS. TO GENOA.

**Figures 2-23. Photographs of 21 *L. higginsii* and 1 *L. siliquoidea* collected near Hudson on the St. Croix R. and sent to the Genoa National Fish Hatchery.**







L. Higgins: #766, 1 May 2002, Hudson  
St. Croix R., St. 201, WNDP Photo



L. Higgins: #767, 1 May 2002, Hudson  
St. Croix R., St. 201, WNDP Photo



L. Higgins: #768, 1 May 2002, Hudson  
St. Croix R., St. 201, WNDP Photo



L. Higgins: #769, 1 May 2002, Hudson  
St. Croix R., St. 201, WNDP Photo



L. bigginsi #771, 7 May 2002, Hudson  
St. Croix R., St. 201, WNDP Photo



L. bigginsi #780, 7 May 2002, Hudson  
St. Croix R., St. 201, WNDP Photo



L. bigginsi #781, 7 May 2002, Hudson  
St. Croix R., St. 201, WNDP Photo



L. bigginsi #782, 7 May 2002, Hudson  
St. Croix R., St. 201, WNDP Photo



L. Hoggins #784, 1 May 2002, Hudson  
St. Croix R., St. 201, WNDP Photo



L. Hoggins #785, 1 May 2002, Hudson  
St. Croix R., St. 201, WNDP Photo



L. Hoggins #786, 1 May 2002, Hudson  
St. Croix R., St. 201, WNDP Photo



L. Hoggins #787, 1 May 2002, Hudson  
St. Croix R., St. 201, WNDP Photo





**Figures 24-26. Copies of 1 May 2003 and 9 May 2003 Field Data Sheets for the Collection of *L. higginsii* from the St. Croix River near Hudson, Wisconsin for Propagation at the Genoa National Fish Hatchery.**



Figure 24.

State of Wisconsin  
Department of Natural ResourcesWISCONSIN MUSSEL SURVEY FORM  
Form 1700-29 8-90

WBIC: 260140 sheet 1 of 1 Source Code: 25 WI  
 Date (mm/dd/yy): 05/02 Waterbody: St. Croix R. Site/Bed Name: St. Croix  
 7.5' Quad: 29 N, R 20W, S 26 Quadcode: 29 Lat: 0 'N Long: 0 'W  
 T 29 N, R 20W, S 26 of SW of NW of SE Co.: 90 Fago R. M.: 17 28  
 T 29 N, R 20W, S 26 of SW of NW of SE Co.: 90 USACOE R. M.: 17 28  
 Area Sa. ed (m<sup>2</sup>) 2 Tran. or Stat. # 201 Sta. Dist. from Bank (m): 38 Bank (L or R): R H<sub>2</sub>O C: 9.0  
 Current 1 Depth (m) 1 SUBSTRATE: 1 % bedrock 1 % hardpan 1 % boulder 1 % rubble  
1 % gravel 1 % coarse sand 1 % fine sand 1 % muck & silt 1 % clay 1 % detritus  
 Method (circle one): 1= random pt. 2= transect 3= shore coll. 4= inventory 5= rare & assoc. 6= targeted  
 taxon 7= Harvest Sample 8= community rel. abun. 9= incremental coll. (by 1) other:  
 Crew (circle collector): WONR (Cameron House, St. Croix, WI) (David, Heath, et al.)  
 Directions: GPS - 44° 58' 05.4" N, 92° 46' 07.2" W all 3 divers ~ 15 m W of here  
 Comments: Dive times: Nov. 10:55 - 11:20, + 13:00 - 14:20. +

Search for 17 around L.L. for species hatching procedure. This 17° C  
Rejects about 1 Body length from upstream cage, 8 out of 8  
St (but from upstream edge of moored clearing N 44° 58' 05.4" W 92° 46' 07.2")

TAXON	total # for taxon		length	height	age	sex	gravid	tag	pres	length	height	age	sex	gravid	tag	pres
living	dead															
<i>L. stagnalis</i>	1		77	71	13	F	Y	755		extending gills out thru 25/14; displaying fully inflated						
<i>L. heppinsi</i>	1		81	58	14	M	-	759								
"	1		85	63	13	F	Y	766		extending thru 20.2 g						
"	1		84	61	15	M	Y	760		fully changed						
"	1	0	81	63	11	M		1313								
"	1	0	100	74	20	M		761								
"	1	0	67	55	8	F	Y	762		fully changed						
"	1	0	79	67	10	F	Y	763		fully changed						
"	1	0	75	63	14	F	Y	764								
"	1	0	59	50	7	F	Y	765		slightly changed						
"	1	0	77	68	13	F	Y	766		fully changed						
"	1	0	83	66	17	F	Y	767		fully changed						
"	1	0	60	53	7	F	Y	768		fully changed						
"	1	0	42	32	5	F	Y	769		fully changed						
"	1	0	64	57	9	F	Y	770		extending thru many gills						
"	1	0	76	57	15	M		1000								
"	1	0	87	64	17	M		1383								
"	1	0	84	64	23	M		1707								
"	1	0	82	64	18	F	Y	732		fully changed						
"	1	0	91	69	20	M		771								
"	1	0	78	62	23	F	Y	1570		fully changed						
"	1	0	86	63	23	M		1291								
"	1	0	91	62	13	M		1573								
"	1	0	98	68	17	M		772								
"	1	0	78	62	16	F	Y	753		1/2 changed						
"	1	0	74	60	15	F	Y	726		1/2 changed						
"	1	0	82	66	22	F	Y	757		1/2 changed						
"	1	0	72	58	22	F	Y	749		fully changed						
"	1	0	92	73	15	F	N	773		Not Gravid						
"	1	0	73	60	13	F	Y	772		1/4 changed						
"	1	0	64	54	9	F	Y	775		fully changed						
"	1	0	76	62	15	F	Y	774		fully changed						

Good 2 ✓ sheet 157635,  
57722-57930

(over)

Initials: \_\_\_\_\_



Figure 25

TAXON	total # for taxon		length	height	age	sex	gravid	tag	pres	length	height	age	sex	gravid	tag	pres
	living	dead														
L. Higsoni	1	0	72	59	11	F	Y	733								
"	1	0	85	68	21	M		733								
"	1	0	78	60	9	M		1509								
"	1	0	78	65	20	F	Y	725								
"	1	0	49	35	5	F		724								
"	1	0	73	58	8	F	Y	738								
"	1	0	75	60	17	F	Y	741								
"	1	0	60	48	6	M		725								
"	1	0	85	66	17	F	Y	724								
"	1	0	64	54	8	F	Y	727								
"	1	0	69	59	9	F	N	728								
"	1	0	72	56	7	F	Y	727								
"	1	0	77	62	11	F	Y	729								
"	1	0	72	60	9	F	Y	721								
"	1	0	72	60	9	F	Y	722								
"	1	0	50	42	6	F	Y	723								
"	1	0	75	65	11	F	Y	724								
"	1	0	94	77	22	F	Y	725								
"	1	0	65	65	23	F	Y	726								
"	1	0	76	62	14	F	Y	727								
"	1	0	81	69	16	F	Y	728								
"	1	0	87	69	23	M	Y	729								
L. siliguanensis	1	0	93	61	14	F	N	730								
L. hirsutus	1	0	81	61	19	F	Y	731								
"	1	0	72	61	18	F	Y	732								
"	1	0	72	61	18	F	Y	733								
"	1	0	92	70	19	F	Y	734								
"	1	0	84	69	23	F	Y	735								
Total number delivered to																
Higsoni																
510000 Delivered																
must be 727 (N/A)																
758 724																
727 725																
791 726																
722																
769																
793																
744																
785																
788																
767																
762																
790 "perphenis"																
781																
770																
764																
766																
762																
780																
763																

Figure 26.

5-9-02  
Hudson Lk & L.S.  
return.

Hat. H<sub>2</sub>O 15°C.

Cooler @ Hudson  
13.50°C @ 12:49 p.

795 #  
763  
767  
766  
794  
787  
793  
758  
786  
770  
769 ~~may be 790 or 770~~  
782  
785  
788  
~~79~~  
781  
764  
~~784~~ near Jim's back porch  
762  
780

also 784, 768 turbine's done

13:23 - 13:32  
Rene 10.0°C @ 13:24.

Returning to Willow (marked)  
on upstr. end of house clearing

Not used

791  
770? or 790 - } all 3 not used at Geneva